

# ADDENDUM

Date Issued:	Jan 7, 2025
Project:	Intermountain Health NUC Med Remodel 3741 West 12600 South Riverton, Utah 84065
Addendum Number:	1

The Contractors submitting proposals on the above-captioned project shall be governed by the following addendum, changes and explanations to the drawings and specifications and shall submit their bids in accordance therewith.

Item Number	General Items Description
1	Contractor's dumpster shall have provision to cover dumpster when not in use to prevent debris from flying away.
2	Contractor shall be responsible for disposing of any waste or packaging generated by the owner's vendor (GE) as it relates to equipment packaging and installation. Coordinate with vendor for packaging to be disposed.
3	Roof where mechanical fan is being replaced is warrantied through 2036 by Firestone/Utah Tile & Roofing. Contact Marty Fawson ( <a href="mailto:mfawson@utri.com">mfawson@utri.com</a> ) to coordinate warranty work.

Sheet Number	Drawings
<b>Architectural Drawings</b>	
G001	Revise note for vendor equipment installation as indicated.
A110	Add sheet. Add keynote 01.56 as indicated.
A111	Add ICRA barriers as indicated.
A113	Add seam for new flooring as indicated. Add keynote 01.58

## Attachments:

G001, A110, A111, A113, Physicist's Shielding Report

Intermountain Healthcare

# Riverton Hospital

# NUC Med Remodel

3741 West 12600 South  
Riverton, Utah 84065

## Construction Documents

### NOTES ON VENDOR EQUIPMENT INSTALLATION

GE DRAWINGS FOR XRAY UNIT INSTALLATION HAVE BEEN INCLUDED AS PART OF THE CONSTRUCTION DOCUMENTS FOR COORDINATION PURPOSES. THE OWNER, INTERMOUNTAIN HEALTH, SHALL PAY GE DIRECTLY FOR THEIR CONSTRUCTION WORK. GENERAL CONTRACTOR AND SUB-CONTRACTORS SHALL COORDINATE WITH GE INSTALLATION DRAWINGS, AND PROVIDE REQUIRED WORK SCHEDULING DURING CONSTRUCTION. **ITEMS MENTIONED AS "PROVIDED BY OTHERS" IN THE GE DRAWINGS SHALL BE PROVIDED BY GENERAL CONTRACTOR AND THEIR SUB-CONTRACTORS.** IF THERE IS ANY CLARIFICATION REQUIRED, CONTRACTORS SHALL CHECK WITH THE A/E DESIGN TEAM DURING THE BIDDING PHASE.

CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ANY WASTE OR PACKAGING GENERATED BY THE OWNER'S VENDOR (GE) AS IT RELATES TO EQUIPMENT PACKAGING AND INSTALLATION. COORDINATE WITH VENDOR FOR PACAKAGING TO BE DISPOSED.

### DESIGN TEAM

ARCHITECT  
**NJRA Architects, Inc.**  
5223 South Ascension Way, Suite 350  
Murray, Utah 84123  
Phone: 801.364.9259

Contacts:  
Project Manager: Robert Howell  
Email: robhow@njraarchitects.com

MECHANICAL ENGINEER  
**VBFA**  
181 E 5600 S, #200  
Murray, UT 84107  
Phone: 801.530.3148

Contacts:  
Project Manager: Jared Smith  
Email: jsmith@vbfa.com

ELECTRICAL ENGINEER  
**Spectrum Engineers**  
324 S State St Suite 400  
Salt Lake City, UT 84111  
Phone: 801.328.5151

Contacts:  
Project Manager: Brendan Arlto  
Email: brendan.arlto@speceng.com

STRUCTURAL ENGINEER  
**Reaveley Engineers**  
515 E 100 S #1200  
Salt Lake City, UT 84102  
Phone: 801.466.3883

Contacts:  
Project Manager: Cameron Luvvardi  
Email: cluvvardi@reaveley.com



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Intermountain Healthcare  
Riverton Hospital  
NUC Med Remodel

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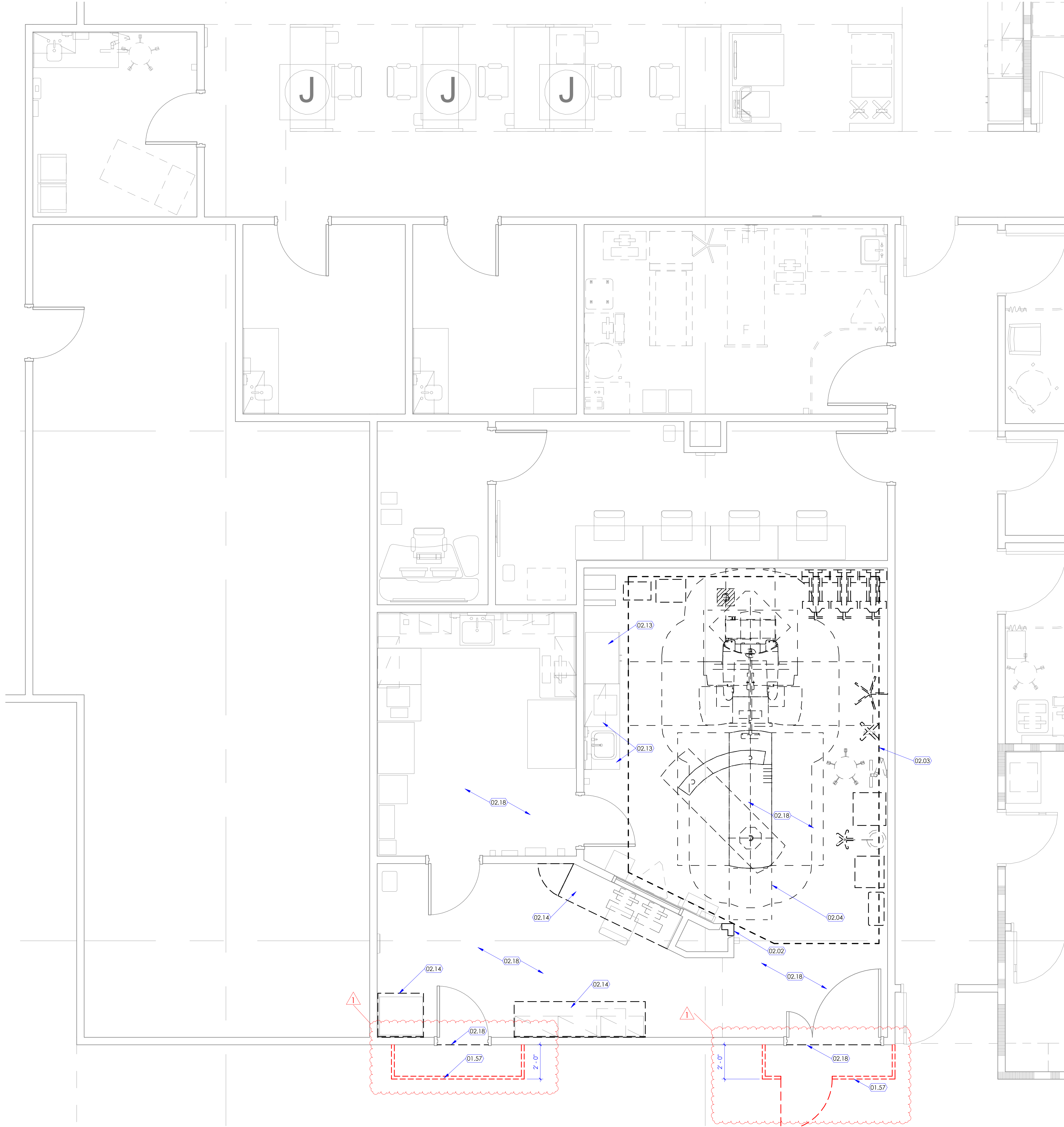
NJRA Project # 24216.00  
Construction Documents Oct 18, 2024  
1 Addendum #01 Jan 7, 2025

Cover Sheet

G001

1/7/2025 11:51:26 AM

1 Demolition Floor Plan Level 1  
SCALE: 3/8" = 1'-0"



KEYED NOTES

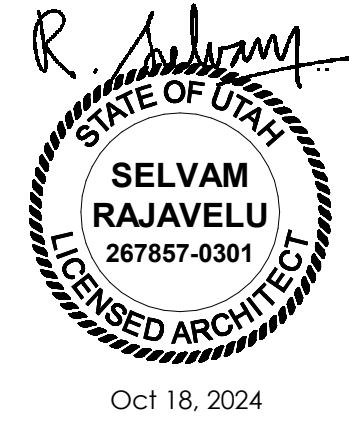
- 01.57 DUST PARTITION (FROM FLOOR TO CEILING) WITH DOORS AS REQUIRED TO ACCESS CONSTRUCTION ZONE. LOCATE AND ALIGN PARTITION WITH CEILING GRID AND/OR GYPSUM BOARD CEILING (WHERE OCCURS) ABOVE AS MUCH AS POSSIBLE FOR TIGHT SEAL. IF THERE IS A CONFLICT, WHERE PARTITION ABUTS CEILING, MOVE ITEMS MOUNTED ON CEILING SUCH AS EXIT SIGN, FIRE/SMOKE ALARM, LIGHT FIXTURE, DIFFUSER, RETURN AIR GRILLE, SENSOR, ETC., TEMPORARILY AWAY FROM THE LOCATION. PROVIDE ANTE ROOM AS INDICATED. MAINTAIN NEGATIVE AIR PRESSURE IN THE CONSTRUCTION ZONE WITH REQUIRED PORTABLE VACUUM MACHINE (OR EXHAUST FANS), WITH HEPA FILTERS, TEMPORARY FLEXIBLE HOSE TYPE DUCTS TO EXHAUST FILTERED AIR AS INDICATED. DUST PARTITION SHALL BE FIRE RATED, POLYCARBONATE, TRANSLUCENT, PLASTIC PANELS WITH METAL FRAMES ON ALL SIDES. INSTALL PARTITION PER MANUFACTURER'S RECOMMENDATIONS. PARTITION MANUFACTURER SHALL BE "EDGE-GUARD" OR EQUIVALENT. MOVE ACCESS DOOR TO THE CONSTRUCTION ZONE AS REQUIRED DURING THE CONSTRUCTION PHASE. SEE "ICRA" (INFECTION CONTROL RISK ASSESSMENT) REQUIREMENTS AND ICRA WORK PERMIT FORM IN THE PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.
- 02.02 WALL, EXISTING INDICATED WITH DASHED LINE TO BE REMOVED. CHAMFER WALL WHERE POSSIBLE TO EASE CORNER.
- 02.03 FLOOR SLAB, EXISTING TO BE REMOVED. SAWCUT AND REMOVE SLAB AS INDICATED.
- 02.04 EQUIPMENT, EXISTING INDICATED WITH DASHED LINES IN THIS AREA TO BE REMOVED BY VENDOR (NOT IN CONTRACT)
- 02.13 CABINET (AND COUNTERTOP WHERE OCCURS), EXISTING TO REMAIN. PROTECT CABINET AND COUNTERTOP FROM DAMAGE DURING CONSTRUCTION.
- 02.14 COUNTERTOP, EXISTING INDICATED WITH DASHED LINE TO BE REMOVED AND REPLACED.
- 02.18 FLOOR COVERING, EXISTING INDICATED IN THIS AREA TO BE REMOVED. COORDINATE EXTENT OF REMOVAL WITH FINISH FLOOR PLANS FOR NEW FLOOR COVERING LOCATIONS AND TRANSITION LINE BETWEEN EXISTING AND NEW FLOOR COVERINGS

GENERAL NOTES

- A. SEE SHEET G003 AND G005 FOR SYMBOLS, GENERAL NOTES AND LEGEND.  
B. SEE SHEET A505A FOR CABINET LEGEND.  
C. SEE SHEET A601A FOR DOOR SCHEDULE.  
D. SEE SHEET A602A FOR WINDOW SCHEDULE.  
E. SEE SHEET A603A FOR FINISH SCHEDULE AND GENERAL NOTES.



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Riverton Hospital  
NUC Med Remodel

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NJRA Project # 24216.00  
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Demolition  
Floor Plan  
Level 1

A111



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1 Floor Plan Level 1  
SCALE: 3/8" = 1'-0"

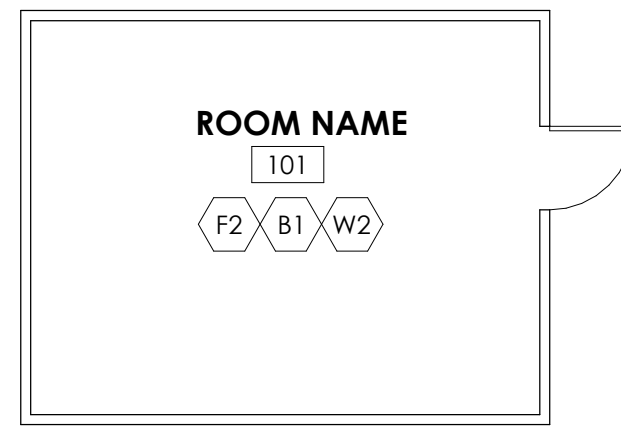


KEYED NOTES

- 01.58 CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF VENDOR'S EQUIPMENT PACKAGING. COORDINATE WITH VENDOR AS REQUIRED.
- 03.01 CONCRETE SLAB ON GRADE: 6 1/2" THICK. THE SURFACE OF THE NEW SLAB MUST BE SMOOTH AND WITHOUT SIGNIFICANT VALLEYS OR PEAKS. THE ENTIRE SURFACE AREA MUST HAVE AN OVERALL FLATNESS OF 0.2 IN. COVER 59 IN. IN ANY DIRECTION. SEE STRUCTURAL DRAWINGS. SEE VENDOR DRAWINGS.
- 06.03 NEW SOLID SURFACE COUNTERTOP. SEE FINISH SCHEDULE.
- 09.01 PATCH AND PAINT. IN THIS ROOM PATCH WALL AND TOUCHUP PAINT AS REQUIRED.
- 09.02 SEAM FOR FLOORING. COORDINATE SEAM FOR NEW FLOOR WITH EXISTING FLOORING AT THIS LOCATION.
- 09.06 GYPSUM BOARD, 5/8" THICK, ATTACHED TO METAL STUD FRAMING. PROVIDE FIRE RATED (TYPE X) GYPSUM BOARD. EXTEND WALL FRAMING AND GYPSUM BOARD ABOVE CEILING TO DECK TO MATCH ADJACENT AS REQUIRED. PREPARE WALL TO RECEIVE FINISH TO MATCH ADJACENT. THIS CORNER SHALL BE CHAMFERED WHERE POSSIBLE TO EASE THE CORNER.
- 09.22 LEAD LINED DRYWALL. WHERE WALL PATCHING IS REQUIRED, PATCH WALL WITH LEAD LINED DRYWALL WITH EQUIVALENT OR GREATER LEAD (Pb) THICKNESS. SEE PHYSICISTS REPORT.
- 11.01 NEW PET/CT EQUIPMENT. SEE VENDOR DRAWINGS. SEE ELECTRICAL DRAWINGS.
- 11.02 BLANKET WARMER. UNLESS NOTED OTHER WISE, THIS APPLIANCE SHALL BE OWNER FURNISHED. CONTRACTOR INSTALLED.
- 26.19 POWER AND DATA OUTLETS. PROVIDE POWER AND DATA OUTLETS AS REQUIRED. SEE ELECTRICAL DRAWINGS.

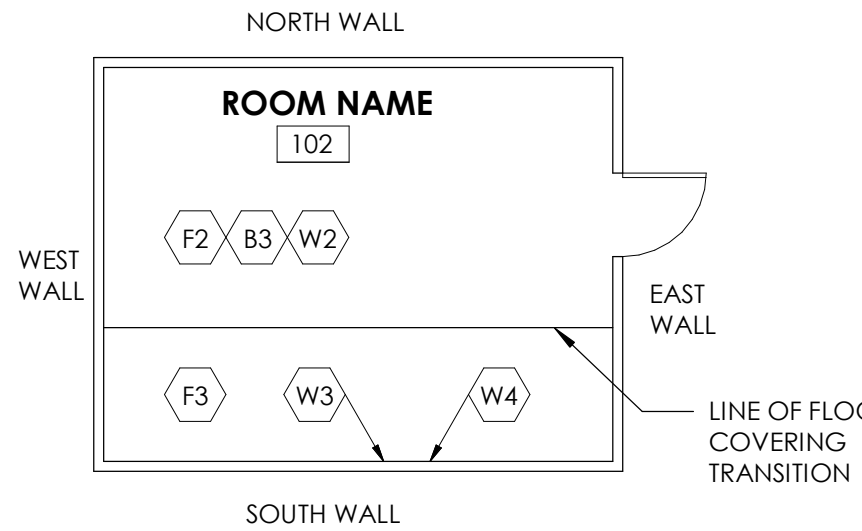
SAMPLE LAYOUTS

SAMPLE LAYOUT 1



NOTE: AS INDICATED IN ROOM NUMBER 101, MAJORITY OF THE ROOMS IN THE PROJECT SHALL HAVE A SINGLE TYPE OF FLOOR FINISH, WALL BASE AND WALL FINISH. WALL FINISH INDICATED AS "W2" SHALL APPLY TO ALL FOUR WALLS FROM FLOOR TO CEILING.

SAMPLE LAYOUT 2



NOTE: AS INDICATED IN ROOM NUMBER 102, SOME ROOMS SHALL HAVE MULTIPLE FLOOR AND WALL FINISHES. SEE GENERAL NOTE "C" ON SHEET A603A FOR FLOOR COVERING TRANSITIONS. THE WALL FINISH INDICATED AS "W2" IN THE ROOM (WITHOUT AN ARROW POINTING TO ANY SPECIFIC WALL) SHALL APPLY TO THE WEST, NORTH AND EAST WALL. WHERE WALL FINISHES ARE INDICATED WITH AN ARROW POINTING TO THE SOUTH SIDE, WALL SHALL HAVE MULTIPLE FINISHES SUCH AS "W3" AND "W4". SEE INTERIOR ELEVATIONS FOR TRANSITION DETAILS BETWEEN "W3" AND "W4".

GENERAL NOTES

- A. SEE SHEET G003 AND G005 FOR SYMBOLS, GENERAL NOTES AND LEGEND.
- B. SEE SHEET A505A FOR CABINET LEGEND.
- C. SEE SHEET A601A FOR DOOR SCHEDULE.
- D. SEE SHEET A602A FOR WINDOW SCHEDULE.
- E. SEE SHEET A603A FOR FINISH SCHEDULE AND GENERAL NOTES.

**NJRA**  
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*R. Selvam*  
STATE OF UTAH  
SELVAM  
RAJAVELU  
267857-0301  
LICENSED ARCHITECT  
Oct 18, 2024

Intermountain Healthcare  
Riverton Hospital  
NUC Med Remodel

3741 West 12600 South  
Riverton, Utah 84065

NJRA Project # 24216.00  
Construction Documents Oct 18, 2024  
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Floor Plan  
Level 1

A113



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Floor Plan Level 1 - Overall

SCALE: 1" = 20'-0"

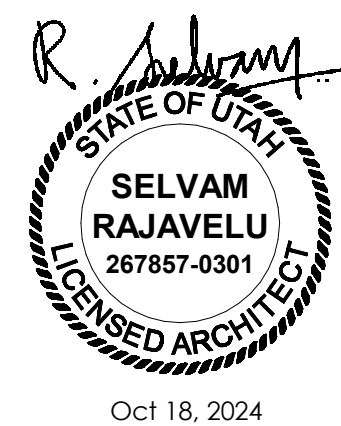


KEYED NOTES

01.56 LINE INDICATES CONTRACTOR ENTRANCE AND EQUIPMENT AND MATERIALS DELIVERY PATH. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING EXISTING FINISHES ALONG THIS PATH. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE ALONG THIS PATH AS A RESULT OF CONSTRUCTION ACTIVITIES OR MATERIALS AND EQUIPMENT DELIVERY. CONTRACTOR SHALL PROVIDE DUMPSTER WITH COVER. COORDINATE DUMPSTER LOCATION WITH OWNER.

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Floor Plan  
Level 1 -  
Overall

A110



January 25, 2016

Aaron Atkinson  
Jacobsen Construction  
3131 West 2210 South  
Salt Lake City, Utah 84119

Dear Mr. Atkinson:

Please find the report on the visual shielding evaluation of the General Radiographic Room and the Nuclear Medicine suite containing an Infinia Hawkeye located within the **Intermountain Riverton Hospital Outpatient Expansion project**. The evaluation was performed based on visual evidence of the lead (Pb) shielding installed in the walls provided by you on August 26, September 30 and November 20, 2015.

### **SHIELDING INSPECTION**

The room survey consisted of a visual inspection of photographs of the necessary lead shielding installed and readily ascertainable. A summary of the results is as follows:

### ***INTERMOUNTAIN RIVERTON HOSPITAL NUCLEAR MEDICINE***

#### **Control Booth:**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

#### **North wall (adjacent to Vascular tech work area):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/16" of lead.

#### **East Wall (adjacent to Corridor):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead

#### **South Wall (adjacent to Corridor):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.



## **INTERMOUNTAIN RIVERTON HOSPITAL GENERAL RADIOGRAPHIC ROOM**

### **Control Booth:**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

### **North wall (adjacent to Corridor):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

### **Room Entrance Door:**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

### **East Wall (adjacent to Waiting and Change Rooms):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

### **West Wall (adjacent to future imaging):**

The lead (Pb) shielding behind all protrusion of the wall appeared to be installed properly. The measured thickness of the lead shielding met or exceeded the specified shielding of the 1/32" of lead.

**SUMMARY: All walls inspected provide adequate radiation protection. The shielding as installed is considered acceptable.**

If you have any questions regarding this evaluation or if I may be of any further assistance, please contact me at 208-860-6260 or lbosworth@mpcphysics.com. Thank you for selecting Medical Physics Consultants for your services.

Sincerely,



Lisa M. Bosworth, M.S.  
Medical Health Physicist

Cc: Lisa Eastman, Imaging Services Manager Riverton Hospital





October 30, 2024

Gavin Swenson  
Imaging Director  
Intermountain Health Riverton Hospital  
3741 W 12600 S  
Riverton, UT 84065

Dear Mr. Swenson,

Please find the report on the confirmation of the original shielding plan of the **Intermountain Health Riverton Hospital SPECT CT Scan Room**. The evaluation was conducted by on-site transmission survey on 10/28/24. A summary of the results is as follows:

***SPECT CT ROOM SHIELDING VERIFICATION***

**Shielding for the West Wall- Hot Lab:**

*The measured shielding (1.85 mm Pb equivalence) met or exceeded the specified shielding of 0.8 mm of Pb equivalence.*

**SUMMARY:** The shielding in the west wall as installed provides the necessary radiation protection to maintain doses less than the 0.02 mSv/week design limit for uncontrolled areas and 0.1 mSv/week for controlled areas.

If you have any questions regarding this report, or if I may be of any further assistance, please contact me at [m Bailey@mpcphysics.com](mailto:m Bailey@mpcphysics.com) or 801-643-0354. I thank you for the opportunity to provide your medical physics coverage.

Sincerely,

A handwritten signature in black ink, appearing to read "Melissa Bailey", on a light-colored background.

Melissa Bailey  
Medical Physicist

Enclosures: Transmission measurements

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Corporate: 214 E. Huron Street, Ann Arbor, MI 48104 (734) 662-3197 Fax: (734) 662-9224

Regional: 50 E. 91st Street, Suite 211, Indianapolis, IN 46240 (317) 581-1911 Fax: (317) 581-1931

Salt Lake City, UT Sussex, WI Springfield, IL

[www.mpcphysics.com](http://www.mpcphysics.com) [mpc@mpcphysics.com](mailto:mpc@mpcphysics.com)



FACILITY: **Intermountain Health Riverton Hospital**ROOM: **SPECT CT Scan**Radiographic Test Techniques: **120 kVp** and **20 mAs**Unattenuated Exposure = **265.5 mR** at **3 feet**

<u>location</u>	measured (mR)	anticipated (mSv)	<u>occupancy</u>	weekly exposure (mSv)	Pb equivalence (mm)
<b><u>Barrier: West wall - Hot Lab</u></b>					
	<i>Tested Distance:</i>		<b>3 feet results in</b>	<b>265.5 mR (incident)</b>	
Behind light switches/outlets	0.302	0.06	100.0%	<b>0.0001</b>	Pass <b>1.85</b>
South end of wall	0.172	0.06	100.0%	<b>0.0001</b>	Pass <b>2.09</b>
Center of wall	0.000	0.06	100.0%	<b>0.0000</b>	Pass <b>&gt;3.2</b>
North end of wall	0.000	0.06	100.0%	<b>0.0000</b>	Pass <b>&gt;3.2</b>
		0.06	100.0%	<b>0.0000</b>	Pass
		0.06	100.0%	<b>0.0000</b>	Pass



October 14, 2024

Gavin Swenson  
Imaging Director  
Intermountain Health Riverton Hospital  
3741 W 12600 S  
Riverton, UT 84065

Dear Mr. Swenson,

Enclosed, please find the calculations for the amount of shielding required in **SPECT CT Scan Room at Intermountain Health Riverton Hospital**. The enclosed calculations are based on information you provided and current radiation protection operational guidelines with regards to X-ray patient workloads, etc. in NCRP Report No. 147.

Installing the specified **required** shielding will reduce the exposure to less than required levels, i.e. 0.02 mSv/week (2 mrem/week) or 1 mSv/year (100 mrem/year) to members of the general public, and 0.1 mSv/week (10 mrem/week) or 5 mSv/year (500 mrem/year) to occupationally exposed employees. If there is existing lead, you can measure the existing thickness, verify the lead extends to a height of 7 feet, and subtract the existing thickness from the calculations. A narrative description of the shielding requirements and recommendations follows.

General Comments:

- Walls are to be constructed with leaded (Pb) drywall of specified thickness with the lead (Pb) extending from the floor to a height of at least seven feet. The screws/nails do NOT need to be capped with lead (Pb). All electrical outlets, switches, and other penetrations of all shielded walls are to be backed with the same thickness of lead (Pb) as the wall that they penetrate.
- The door and jamb are to be lined with the same thickness of lead (Pb) as the wall that they penetrate, unless specified otherwise. Be sure that the leaded doorframe overlaps the lead (Pb) in the gypsum drywall.

**AS REQUIRED BY THE UTAH DIVISION OF WASTE MANGEMENT and RADIATION CONTROL RULE R313-28-32 PLAN REVIEW, YOU MUST SUBMIT A COPY OF THESE LETTERS AND SHIELDING CALCULATIONS TO THE EXECUTIVE SECRETARY WITHIN 14 WORKING DAYS.**

The address is as follows:

UTAH DIVISION OF WASTE MANGEMENT and RADIATION CONTROL  
Doug Hansen, Director  
P.O. Box 144880  
Salt Lake City, UT 84114-4880

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Corporate: 214 E. Huron Street, Ann Arbor, MI 48104 (734) 662-3197 Fax: (734) 662-9224

Regional: 50 E. 91st Street, Suite 211, Indianapolis, IN 46240 (317) 581-1911 Fax: (317) 581-1931

Salt Lake City, UT  Sussex, WI  Springfield, IL

[www.mpcphysics.com](http://www.mpcphysics.com)  [mpc@mpcphysics.com](mailto:mpc@mpcphysics.com)

**If you do not agree with the factors and assumptions used and find them insufficient, please contact me as my calculations may not be valid.**

**Keep a copy of these letters and shielding calculations on-site for as long as the SPECT CT Scan Room in service.**

### **WORKLOAD SPECT CT Room**

For the SPECT CT scan room, 30 procedures/week with an average administered dose of 25 mCi was used for the radionuclide exposure contribution. A CT workload of 8 cardiac procedures (100 mGy-cm DLP), 5 bone procedures (400 DLP), 2 miscellaneous procedures (400 DLP), as well as typical scatter rates were used in the calculations.

### **SPECT CT SCAN ROOM SHIELDING SPECIFICATIONS**

#### **North Wall- EKG/Echo Tech Area:**

Required shielding: 1.6 mm lead (Pb) equivalence (1/16" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.002 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

#### **East Wall- Corridor:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.001 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

#### **South Wall- Corridor:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.0004 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

#### **Patient Entry Door:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.0002 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

#### **Control Booth:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.004 mSv/week, which is less than the 0.1 mSv/week limit for a controlled area.



**SPECT CT SCAN ROOM 128 SHIELDING SPECIFICATIONS, continued****West Wall- Hot Lab and Door:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.009 mSv/week, which is less than the 0.1 mSv/week limit for a controlled area.

**West Wall- EKG/Echo Tech Area:**

Required shielding: 0.8 mm lead (Pb) equivalence (1/32" commercially available)

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.007 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

**Floor:**

Required shielding: 0 mm lead (Pb) equivalence.  
**Structure meets the required shielding.**

COMMENT: Structure on grade.

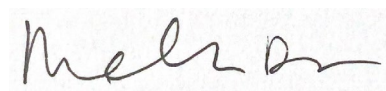
**Ceiling- Endoscopy:**

Required shielding: 0 mm lead (Pb) equivalence  
**Structure meets the required shielding.**

COMMENT: The required amount of shielding will reduce the weekly exposure to approximately 0.003 mSv/week, which is less than the 0.02 mSv/week limit for an uncontrolled area.

If you have any questions regarding this report, or if I may be of any further assistance, please contact me at [m Bailey@mpcphysics.com](mailto:m Bailey@mpcphysics.com).

Sincerely,



Melissa Bailey  
Medical Physicist

CC: Robert Howell

Enclosures: Thickness Drawing  
Rad/Fluoro Shielding Calculations



Facility: Intermountain Riverton Hospital

Date: 10/9/2024

Physicist: Melissa Bailey

Room #: SPECT CT Scan Room

Dose Equivalent Rate Constants and Barrier Transmission Data from Nuclear Medicine Facility Dose Calculations and Shielding

Patients per Week (Nw)  
Enter 30

Avg (mCi) Injected/pt (Aa)  
25.0

Imaging Time (Ti) Min  
Enter 995

Total # of Pts/Week  
30

Total (mCi) Injected Decay Corrected  
Enter 305.1

Avg Imaging Time Ti (Hr)  
0.553

Tc99m Patient Dose Rate  
uSv-m2/MBq-h  
0.0161

Scanner Reduction Factor (Sf)  
1.0

Equation #1

Weekly Dose = ((0.0161 uSv m2 /MBq h) x Nw x Aa(MBq) x Sf x Ti(h) / d(m)2 ) x T

Equation #2

Transmission Factor (B) = 62.1 x P x d(m)2 /((T x Nw x Ao(MBq) x Sf x Ti (h))

Barrier:	North Wall	East Wall	South Wall	South Door	South/West	West Wall	West Wall
Description:	EKG/Echo Tech Area	Corridor	Corridor	Corridor	Control Area	Hot Lab	EKG/Echo Tech Area

Occupancy Factor (T)	1.000	0.200	0.200	0.125	1.000	1.000	1.000
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Annual Limit (mSv) (P)	1	1	1	1	5	5	1
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(100 mRem = 1 mSv)

Distance (inches)	84.00	138.00	270.00	270.00	172.00	115.00	132.00
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uSv per week	54.25	4.02	1.05	0.66	12.94	28.95	21.97
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Equation #1

B Transmission Factor	0.37	4.97	19.04	30.46	7.73	3.45	0.91
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Equation #2

Pb Thickness (mm)	0.49	0.00	0.00	0.00	0.00	0.00	0.06
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Concrete Thickness (cm)	6.25	0.00	0.00	0.00	0.00	0.00	1.33
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Pb Thickness (in)	0.019	0.000	0.000	0.000	0.000	0.000	0.002
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Concrete Thickness (in)	2.46	0.00	0.00	0.00	0.00	0.00	0.52
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# SPECT-CT IMAGING ROOM CT SHIELDING CALCULATIONS

Facility:

Date:

Physicist:

Room Number:

Cardiac Procedures / Week  
Enter

Technique (DLP) Cardiac  
Enter

Bone Procedures / Week  
Enter

Technique (DLP) Bone  
Enter

Misc Procedures / Week  
Enter

Technique (DLP) Misc  
Enter

Total # Procedures / Week

Technique (kVp)  
Enter

NCRP 147 Equation A2

$$X = \frac{1}{\alpha \gamma} \ln \left( \frac{B^{-\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}} \right) \quad B = \frac{\left( \frac{P}{100} \right) T}{Sc}$$

Barrier:	North Wall	East Wall	South Wall	South Door	South/West	West Wall	West Wall	Ceiling
Description:	XG/Echo Tech Ar	Corridor	Corridor	Corridor	Control Area	Hot Lab	XG/Echo Tech Ar	Endoscopy
Occupancy Factor (T)	1.000	0.200	0.200	0.125	1.000	1.000	1.000	1.000
Annual Limit (mSv) (P) 100 mRem = 1 mSv	1.000	1.000	1.000	1.000	5.000	5.000	1.000	1.000
Distance (inches)	84.000	138.000	270.000	270.000	172.000	115.000	132.000	214.000
Exposure Limit (mSv) Weekly (P)	0.02	0.02	0.02	0.02	0.1	0.1	0.02	0.02
Distance (m)	2.13	3.51	6.86	6.86	4.37	2.92	3.35	5.44
Incident Scatter (mGy/wk) (Sc)	0.28	0.11	0.03	0.03	0.07	0.15	0.12	0.04
Transmission Factor (B)	0.070	0.948	3.629	5.806	1.473	0.658	0.173	0.456
Pb Thickness (mm) (X)	0.53	0.01	0.00	0.00	0.00	0.06	0.30	0.11
Concrete Thickness (cm) (X)	5.93	0.10	0.00	0.00	0.00	0.82	3.76	1.59
Steel Thickness (cm) (X)	0.34	0.00	0.00	0.00	0.00	0.02	0.17	0.05
Pb Thickness (in)	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Concrete Thickness (in)	2.33	0.04	0.00	0.00	0.00	0.32	1.48	0.63
Steel Thickness (in)	0.14	0.00	0.00	0.00	0.00	0.01	0.07	0.02



Facility: Intermountain Riverton Hospital

Date: 10/9/2024

Physicist: Melissa Bailey

Room Number: SPECT CT Scan Room

Barrier:	North Wall	East Wall	South Wall	South Door	South/West	West Wall	West Wall	Ceiling
Description:	G/Echo Tech Ar	Corridor	Corridor	Corridor	Control Area	Hot Lab	G/Echo Tech Ar	Endoscopy
Pb Thickness (inches)	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year
No Shielding	14.23	1.05	0.28	0.17	3.40	7.59	5.76	2.19
1/32	0.42	0.03	0.01	0.01	0.10	0.22	0.17	0.06
1/16	0.05	0.00	0.00	0.00	0.01	0.03	0.02	0.01
3/32	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1/2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3/4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 3/32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 3/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Thickness (inches)	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year
No Shielding	14.23	1.05	0.28	0.17	3.40	7.59	5.76	2.19
1/32	4.87	0.36	0.09	0.06	1.16	2.60	1.97	0.75
1/16	2.61	0.19	0.05	0.03	0.62	1.39	1.06	0.40
3/32	1.64	0.12	0.03	0.02	0.39	0.87	0.66	0.25
1/8	1.12	0.08	0.02	0.01	0.27	0.60	0.45	0.17
3/16	0.60	0.04	0.01	0.01	0.14	0.32	0.24	0.09
1/4	0.35	0.03	0.01	0.00	0.08	0.19	0.14	0.05
5/16	0.22	0.02	0.00	0.00	0.05	0.12	0.09	0.03
3/8	0.14	0.01	0.00	0.00	0.03	0.08	0.06	0.02
7/16	0.09	0.01	0.00	0.00	0.02	0.05	0.04	0.01
1/2	0.06	0.00	0.00	0.00	0.01	0.03	0.03	0.01
5/8	0.03	0.00	0.00	0.00	0.01	0.02	0.01	0.00
3/4	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00
7/8	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 3/32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 3/16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 1/4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00





Facility: Intermountain Riverton Hospital

Date: 10/9/2024

Physicist: Melissa Bailey

Room Number: SPECT CT Scan Room

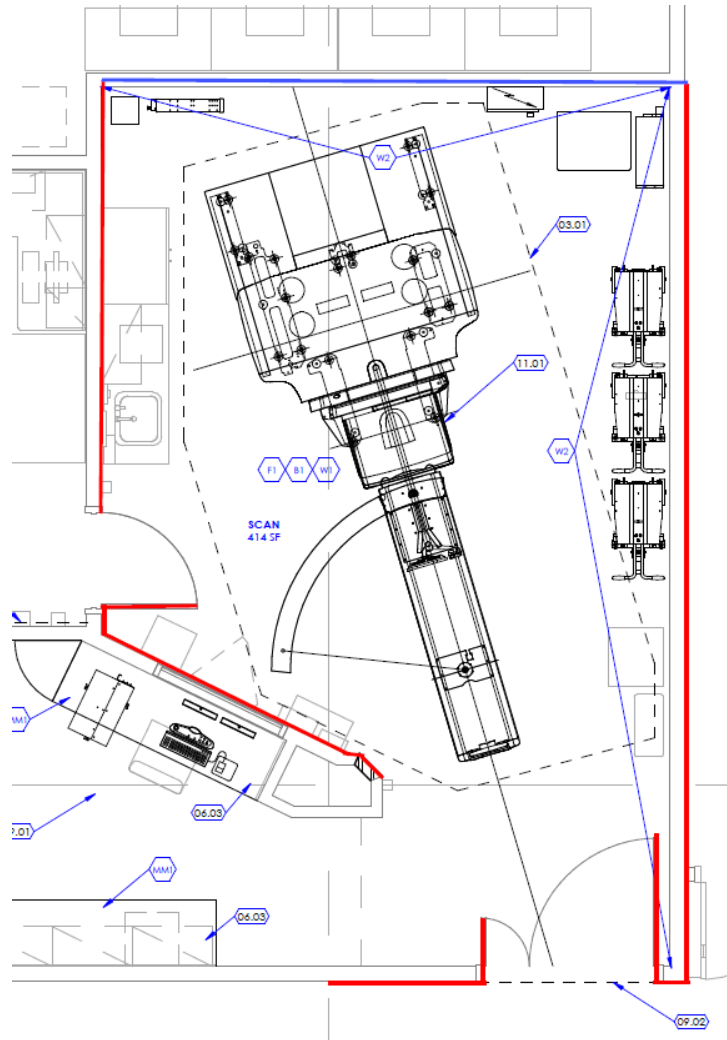
Barrier:	North Wall	East Wall	South Wall	South Door	South/West	West Wall	West Wall	Ceiling
Description:	XG/Echo Tech Area	Corridor	Corridor	Corridor	Control Area	Hot Lab	XG/Echo Tech Area	Endoscopy
Concrete Thickness (inches)	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year	mSv / year
No Shielding	14.23	1.05	0.28	0.17	3.40	7.59	5.76	2.19
0.5	7.56	0.56	0.15	0.09	1.80	4.03	3.06	1.16
1	4.21	0.31	0.08	0.05	1.00	2.25	1.70	0.65
1.5	2.42	0.18	0.05	0.03	0.58	1.29	0.98	0.37
2	1.42	0.11	0.03	0.02	0.34	0.76	0.57	0.22
2.5	0.84	0.06	0.02	0.01	0.20	0.45	0.34	0.13
3	0.51	0.04	0.01	0.01	0.12	0.27	0.21	0.08
3.5	0.31	0.02	0.01	0.00	0.07	0.16	0.12	0.05
4	0.19	0.01	0.00	0.00	0.04	0.10	0.08	0.03
4.5	0.11	0.01	0.00	0.00	0.03	0.06	0.05	0.02
5	0.07	0.01	0.00	0.00	0.02	0.04	0.03	0.01
5.5	0.04	0.00	0.00	0.00	0.01	0.02	0.02	0.01
6	0.03	0.00	0.00	0.00	0.01	0.01	0.01	0.00
6.5	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00
7	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
7.5	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Physicist:	Melissa Bailey
Room Number:	SPECT CT Scan Room

[illegible]

## Intermountain Riverton Hospital SPECT CT Scan Room Thickness Drawing



**As Low As Reasonably Achievable (ALARA) recommendation: 1/16" for all barriers/doors**

Floor      Ceiling

0" Pb shielding		1/8" Pb Shielding	
1/32" Pb shielding		3/16" Pb Shielding	
1/16" Pb shielding		1/4" Pb Shielding	
3/32" Pb Shielding		1/2" Pb Shielding	

Drawing is intended as a visual depiction of the commercially available lead thickness that meets the required specification. Other thicknesses and materials can be used provided the Pb equivalency meets/exceeds the required specifications in the report.